



# PHYSICS NMDCAT

## TOPIC WISE TEST (UNIT-2)

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**SAEED MDCAT TEAM**

### TOPICS:

#### ✓ Work and Energy

- Q. 1 A force  $F = (5\hat{i} + 3\hat{j})$  newton is applied over a particle which displaces it from its origin to the point  $r = (2\hat{i} - 1\hat{j})$  metres. The work done on the particle is
- A. - 7 joules  
B. + 13 joules  
C. + 7 joules  
D. + 11 joules
- Q. 2 A man pushes a wall and fails to displace it. He does
- A. Negative work  
B. Positive but not maximum work  
C. No work at all  
D. Maximum work
- Q. 3 Find the work done by a force of 10N applied to a lawn roller, when the force acts making an angle of  $60^\circ$  with the horizontal, moving the roller through a horizontal distance of 10m.
- A. 50 J  
B. 75 J  
C. 25 J  
D. 100 J
- Q. 4 A force  $\vec{F} = 5\hat{i} + 6\hat{j} - 4\hat{k}$  acting on a body produces a displacement  $\vec{S} = 6\hat{i} + 5\hat{k}$ . What is the work done by the force?
- A. 5 units  
B. 15 units  
C. 10 units  
D. 20 units
- Q. 5 A force of 10N acts on a body of mass 2kg for 1m distance. The K.E. obtained by the body is
- A. 20 J  
B. 5 J  
C. 10 J  
D. 2.5 J
- Q. 6 Two bodies having kinetic energies in the ratio of 4:1 are moving with equal linear momentum the ratio of their masses is
- A. 1:2  
B. 4:1  
C. 1:1  
D. 1:4
- Q. 7  $(60\hat{i} + 15\hat{j} - 3\hat{k})$ N force produces velocity  $(2\hat{i} - 4\hat{j} + 5\hat{k})$  m/s in a particle. The value of power at that time will be:
- A. 95W  
B. 45W  
C. 75W  
D. 100W
- Q. 8 Work done is maximum when angle between force and displacement is
- A.  $0^\circ$   
B.  $60^\circ$   
C.  $45^\circ$   
D.  $90^\circ$
- Q. 9 A body consumes 2J K.E in 1 sec then power will be
- A. 2W  
B. 0.5W  
C. 1W  
D. 4W
- Q. 10 Work done due to motion of body while moving downward under the action of gravity is?
- A. Positive  
B. Zero  
C. Negative  
D. None

- Energy can be defined only for
- A. Conservative forces  
B. Non-conservative forces  
C. Both 'A' and 'B'  
D. None of these

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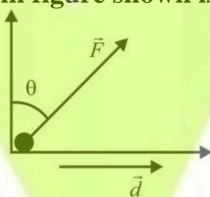


- Q. 13** If velocity is doubled then  
A. P increases 4 times and K.E increases 2 times  
B. P increases 2 times and K.E remain constant  
C. P and K.E remain same  
D. P increases 2 times and K.E increases 4 times
- Q. 14** Force 10 N acts through a distance 20m. The force is then increased to 30 N and then acts through a further distance 40 m. Calculate the work done  
A. 1200 J  
B. 200 J  
C. 1400 J  
D. 1500 J
- Q. 15** A ball of mass 100 g is dropped from height 100 m. Its velocity when its height from ground is 20 m  
A. 40 m/s  
B. 10 m/s  
C. 20 m/s  
D.  $10\sqrt{2}$  m/s
- Q. 16** According to work energy principle work done on body will equal to change its  
A. K.E only  
B. P.E only  
C. K.E and P.E both  
D. All may correct
- Q. 17** Which of the following types of force can do no work on the particle on which it acts?  
A. Frictional force  
B. Gravitational force  
C. Elastic force  
D. Centripetal force
- Q. 18** If a body of mass of 2 kg is raised vertically through 2m, then the work done will be  
A. 38.2 J  
B. 392.1 J  
C. 39.2 J  
D. 3.92 J
- Q. 19** The average power and instantaneous power become equal if work is done at  
A. At any rate  
B. At uniform rate  
C. At variable rate  
D. At high rate
- Q. 20** The relation between horse power and watt is  
A. 1 hp = 546 watts  
B. 1 hp = 1000 watts  
C. 1 hp = 746 watts  
D. 1 hp = 946 watts
- Q. 21** Slope of work time graph is equal to  
A. Displacement  
B. Power  
C. Acceleration  
D. Energy
- Q. 22** Work done by variable force is determined by dividing  
A. force into small interval  
B. both force and displacement into small intervals  
C. displacement into small interval  
D. force into small and displacement into large intervals
- Q. 23** One mega watt hour is equal to  
A.  $36 \times 10^6$  J  
B.  $36 \times 10^9$  J  
C.  $36 \times 10^{12}$  J  
D.  $36 \times 10^8$  J
- Q. 24** When arrow is released from its bow, its energy is transformed from  
A. heat energy to K.E.  
B. chemical energy to elastic P.E.  
C. elastic P.E. to K.E.  
D. K.E. to elastic P.E.
- Q. 25** The dot product of force and velocity is  
A. Power  
B. Impulse  
C. Work  
D. Torque
- Q. 26** What will be the speed of electron having an energy of  $18.2 \times 10^{-17}$  Joule?  
A.  $1.9 \times 10^{18}$   
B.  $2.197 \times 10^{-25}$   
C.  $2 \times 10^7$   
D. None
- Q. 27** The input power to a motor is 300 W. In 20s it lifts a load of 400 N through a height of 6.0 m. What is the efficiency of the motor?  
A. 12%  
B. 25%  
C. 40%  
D. 75%
- Q. 28** A force of 10N acts on a body moving with constant velocity for a distance of 10m. What is the work done by friction if body remains in equilibrium?  
A. 100J  
B. -100J  
C. 0J  
D. Can't be predicted





- Q. 29 Three bricks each of mass  $m$  & thickness  $h$  are placed on floor. Work done to place them over each other is:
- A.  $2 mgh$  B.  $3 mgh$   
C.  $4 mgh$  D.  $6 mgh$
- Q. 30 A body falls freely under gravity. Its velocity is  $v$  when it has lost a potential energy of  $U$ . The mass of the body is
- A.  $\frac{2U}{v^2}$  B.  $\frac{U}{v^2}$   
C.  $\frac{U}{2v^2}$  D.  $v \times U$
- Q. 31 In the presence of air friction, the relation for free falling body is
- A.  $mgh = \frac{1}{2}mv^2 - fh$  B.  $mgh = \frac{1}{2}mv^2 + fh$   
C.  $mgh = fh - \frac{1}{2}mv^2$  D.  $mgh = fg + \frac{1}{2}mv^2$
- Q. 32 If an agent consumes a power of 1kilo-watt in one hour, the work done is
- A. One watt B. One kilo-watt  
C. One kilowatt-hour D. Zero
- Q. 33 A car moving down an inclined plane has
- A. K.E only B. P.E only  
C. Both K.E & P.E D. No energy
- Q. 34 The work done by force " $\vec{F}$ " in figure shown is

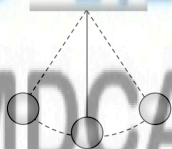


- A.  $Fd \cos \theta$  B.  $Fd \sin \theta$   
C.  $Fd \tan \theta$  D.  $Fd \cot \theta$
- Q. 35 The work done by a force on a body is calculated by multiplying the force by a quantity. Which quantity?
- A. The distance travelled in the direction of the force  
B. The speed in the direction perpendicular to the force  
C. The distance travelled perpendicular to the direction of the force  
D. The velocity in the direction of the force
- Q. 36 A small motor has an input power rating of 10W and is run for 5.0 minutes. What is the electrical energy input to the motor in this time?
- A. 2.0 J B. 300 J  
C. 50 J D. 3000 J
- Q. 37 Power of a water pump is 2 kW. If  $g = 10 \text{ m/sec}^2$ , the amount of water it can raise in one minute to a height of 10 m is
- A. 2000 litre B. 1000 litre  
C. 100 litre D. 1200 litre
- Q. 38 The K.E of bullet of mass 500 gm moving at a speed of  $200 \text{ ms}^{-1}$  is:
- A. 250J B. 125J  
C. 2500J D. 10,000J
- Q. 39 A stone is thrown up from the surface of earth when it reaches at maximum height, its K.E. is equal to
- A.  $mgh$  B.  $\frac{1}{2}mv^2$   
C. Zero D.  $2mgh$





- Q. 40 If the direction of force is perpendicular to the direction of motion of body, then work done is  
A. Minimum  
B. Maximum  
C. Zero  
D. Infinity
- Q. 41 Block and tackle system of pulleys is used to raise a load of 500N through a height of 20m. The work done against friction is 2000J. Calculate the work done by the effort  
A. 12000 J  
B. 8000 J  
C. 6000 J  
D. 4000 J
- Q. 42 At what angle the ratio of  $W_{\max} : W$  becomes  $\sqrt{2} : 1$   
A.  $30^\circ$   
B.  $45^\circ$   
C.  $60^\circ$   
D. Insufficient data given
- Q. 43 The amount of work done by a labourer who carries  $n$  bricks, each of mass 'm', to the roof of a house whose height is  $h$   
A.  $n m g h$   
B.  $\left(\frac{n}{2}\right) m g h$   
C.  $\frac{m g h}{n}$   
D.  $\frac{n g h}{m}$
- Q. 44 If  $\theta > 90^\circ$  work is said to be  
A. Negative  
B. Positive  
C. Zero  
D. None of these
- Q. 45 For an ideal case  
A.  $P_{\text{in}} > P_{\text{out}}$   
B.  $P_{\text{in}} = P_{\text{out}}$   
C.  $P_{\text{in}} < P_{\text{out}}$   
D. None
- Q. 46 If the unit of force and length each be increased by four times, then the unit of energy is increased by  
A. 16 times  
B. 8 times  
C. 2 times  
D. 4 times
- Q. 47 A body at rest may have  
A. Energy  
B. Momentum  
C. Speed  
D. Velocity
- Q. 48 If the stone is thrown up vertically and return to ground, its potential energy is maximum  
A. During the upward journey  
B. At the maximum height  
C. During the return journey  
D. At the bottom
- Q. 49 What is the velocity of the bob of a simple pendulum at its mean position, if it is able to rise to vertical height of 10cm (Take  $g = 9.8 \text{ m/s}^2$ )



- A. 0.6 m/s  
B. 1.4 m/s  
C. 1.8 m/s  
D. 2.2 m/s
- Q. 50 Which of the following is a unit of energy?  
A. kilo watt  
B. Watt  
C. Horse Power  
D. None



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# Phy T-2

	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
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